



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant : Se-Lee Chang et al. Art Unit : 1711  
 Serial No. : 09/690,271 Examiner : Susan W. Berman  
 Filed : October 17, 2000  
 Title : RESIN COMPOSITION FOR MANUFACTURING OPTICAL FIBER RIBBON  
 AND METHOD FOR PREPARING RESIN FOR MANUFACTURING OPTICAL  
 FIBER RIBBON USING THE SAME

Commissioner for Patents  
 Washington, D.C. 20231

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**DECLARATION UNDER 37 C.F.R. § 1.131**

I, Se-Lee Chang, hereby declare that:

1. I am a co-inventor of the subject matter described and claimed in the above-identified patent application.
2. I understand that U.S. Patent No. 5,986,018 to Yamaguchi et al. and U.S. Patent No. 6,023,547 to Tortorello have been cited as prior art to reject claims 1-3, 6-9, and 11-19 of this application. The '018 patent and the '547 patent issued from applications filed on February 20, 1998 and June 9, 1997, respectively.
3. Prior to June 9, 1997, I and co-inventors Jung-Hyun Oh, Woo-Jeong Oh and Ki-Sung Jung had worked together to complete the conception of the invention as described and claimed in the application in Republic of Korea, and had diligently worked also in the same country toward its actual reduction to practice, as evidenced by a copy of three pages of an experimental report, as well as its English translation, attached hereto. Shown in these three pages are a protocol and results of experiments designed to prepare and test an ERIFON silicone type ribbon resin, which is within the scope of the rejected claims. Two dates have been blocked off, both of which are prior to June 9, 1997.

## CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D.C. 20231.

*(June 24, 2002)*  
 Date of Deposit

*Se Lee Chang*  
 Signature

*Susan W. Berman*  
 Typed or Printed Name of Person Signing Certificate

Applicant : Se-Lee Chang et al.  
Serial No. : 09/690,271  
Filed : October 17, 2000  
Page : 2

Attorney's Docket No.: 12495-002001 / OPP 000621  
US

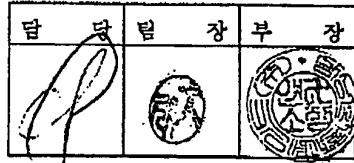
4. All statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Respectfully submitted,

Date: \_\_\_\_\_

Se-Lee Chang

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## 주제별 실험 보고서

과제코드번호 : **RD2UVR - 008**

주 제 : EFIRON      Silicone      도입  
            Type Ribbon Resin 개발 기초 Test

실 험 기 간 : Date Blocked Off

작 성 일 : Date Blocked Off

소 속 : 기술 연구소

작 성 자 : 장 세리 (Chang Se Lee)

삼성 화학 페인트 (주)

1. 제목 : EFIRON Silicone 도입 Type Ribbon Resin 개발 기초 Test

2. 목적 및 실험 방향

EFIRON 10 R 의 Oligomer 에 영구적인 slip 부여하기 위하여

3. 실험 방법

➤ EFIRON 10R 의 Oligomer 를 다시 900g 합성 하였다.

합성의 배합은 다음과 같다.

REAGENT	Oligomer (New) Wt%	Oligomer (기존) Wt%	사용량(g)
PTMG 1000	17.616	31.887	158.544
HSi 2111	14.269	-	128.421
IPDI	31.816	31.816	286.344
DBTDL	0.020	0.02	0.180
2-HPA	26.049	26.049	234.441
HOMMA	0.150	0.15	1.350
DBTDL	0.080	0.08	0.720
IBOA	10.000	10	90.00
Total	100	100	900.00

위의 Oligomer 로 아래와 U.V 배합을 한 후 기본 물성 Test 와 film 열 안정성 Test 를 한다.

(열 안정제 : Di-tert-butyl-methyl-phenol) Test 는 120°C, 2 시간 실험)

	EFIRON (New)	기존 Resin 재현성 Test	Fluorine Type resin
Oligomer	74.5	74.5	74.5
Eo-TMPTA	5	5	-
N-VP	5	5	5
IBOA	9.5	9.5	9.5
SR-339	5	5	5
Darocure#1173	4	4	4
M-3F	-	-	5
Tego 435	0.3	0.3	0.3
열 안정제	-	-	0.5

Total		103.8	103.8	104.3	103.8
Test 항목	기계적 물성 test	○	○	-	○
	액상 물성	○	○	-	○
	열 안정 test	○	-	○	○

- 내열성 Test: Film 시편을 120°C Oven에 넣고 film의 변형을 관찰한다.
- 기계적 물성 Test: Film Modulus, slip 성
- 액상 물성 Test: 점도, 굽결률, 비중, 표면 장력

#### 4. 결과

	EFIRON ( New )	EFIRON ( 기존 )		Fluorine Stabilizer
		-	Heat Stabilizer	
Viscosity at 40°C	1760 cps	1700 cps	-	980 cps
굽결률	1.4899	1.4893	1.4888	1.4848
비중	1.05	1.05	1.05	1.04
표면 장력	23.8	22.8	-	33.25
Young's Modulus( kg/mm <sup>2</sup> )	55.94	55.55	22.5	26.94
Tensile Strength ( kg/mm <sup>2</sup> )	2.74	2.77	1.4	1.66
Elongation(%)	11.92	15.6	28.2	45.94
마찰계수	150	23S	-	300

#### 5. 고찰

위의 실험 결과 Heat Stabilizer를 첨가한 Resin의 경우 50% 정도의 modulus의 저하가 있는 것을 알 수 있었다. Fluorine Monomer 도입 Type Resin의 경우 희석률은 좋으나 Modulus의 저하 문제가 있고 표면 장력과 마찰력의 효과를 주는 데 시간이 걸리는 것을 알 수 있다. 위의 data는 film 제작 후 1일 경과 data이다. 내열성 Test에서 기존의 배합과 두드러진 차이가 없음을 알 수 있었다.



## Verification Statement For Translation

I, LEE, Hye-Sook, hereby declare that I am conversant in the Korean and the English languages and that I am the translator of the document attached and certify that to the best of my knowledge and belief the following is a true and correct English translation of the Experimental Report (Date Blocked Off).

Signature :

A handwritten signature in cursive script, appearing to read 'Leehyesook'.

LEE, Hye-Sook

Date :

June 21, 2002

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**GROUP 1700**

[Translation]



## Experimental Report

Subject code: RD2UVR-008

Subject: Development of EFiRON Silicone Type Ribbon Resin

Period of Experimentation: Date Blocked Off

Written date: Date Blocked Off

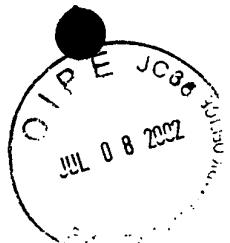
Countersignature: Technical Institute

Written by Se-Lee Chang

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**SAMSUNG CHEMICAL PAINT CO., LTD.**

**1. Subject**

Development of EFIRON Silicone Type Ribbon Resin

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**GROUP 1700****2. Object**

Silicone alcohol is introduced in order to impart an oligomer of EFIRON 10R with permanent slipping properties.

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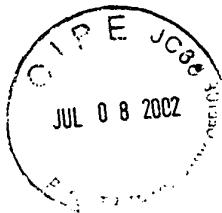
**3. Experimental procedure**

900 g of EFIRON 10R oligomer was synthesized as follows:

Reagent	Oligomer New, wt %	Oligomer Conventional, wt %	Used amount (New oligomer)
PTMG 1000 (diol)	17.616	31.887	158.544
Hsi 2111 (silicone diol)	14.269	-	128.421
IPDI (isocyanate)	31.816	31.816	286.344
DBTDL (catalyst)	0.020	0.020	0.180
2-HPA (acrylate monomer)	26.049	26.049	234.441
HQMMA (polymerization inhibitor)	1.150	1.150	1.350
DBTDL (catalyst)	0.080	0.080	0.720
IBOA (acrylate monomer)	10.000	10.000	90.00
Total	100	100	900.00

Note) In above Table, terms in parenthesis are attached by translator.

The synthesized oligomer, acrylate monomers, initiator etc. were mixed, and a ribbon resin was prepared by radiating UV to the mixture. Then mechanical properties, heat stabilities etc. were tested.



		EFIRON New resin	TEST RIBBON RESIN Conventional resin	Fluorine type resin
Oligomer		74.5	74.5	74.5
Eo-TMPTA (acrylate monomer)		5	5	-
N-VP (acrylate monomer)		5	5	5
IBOA (acrylate monomer)		9.5	9.5	9.5
SR339 (acrylate monomer (2-phenoxyethyl acrylate))		5	5	5
Darocure#1173 (initiator)		4	4	4
M-3F (acrylate fluorine monomer)		-	-	5
Tego 435 (leveling agent)		0.3	0.3	0.3
Heat stabilizer (Iganox 1010)		-	-	0.5
Total		103.8	103.8	104.3
Test	Mechanical properties	O	O	-
	Liquid-phase properties	O	O	-
	Heat stability	O	-	O

Note)

In above Table, terms in parenthesis are attached by translator.

Mechanical properties include film modulus, slipping properties etc.

Liquid-phase properties include viscosity, reflective index, gravity, and surface tension.

Heat stability is tested by placing the film specimen in a 120°C oven for 2 hours and observing modification of the film specimen.

#### 4. Results

	EFIRON (New)	EFIRON (Conventional)		Fluorine type resin
		Without heat stabilizer	With heat stabilizer	
Viscosity at 40 °C	1760 cps	1700 cps	-	980 cps
Reflective index	1.4899	1.4893	1.4888	1.4848
Gravity	1.05	1.05	1.05	1.04
Surface tension	23.8	22.8	-	33.25
Young modulus (kg/mm <sup>2</sup> )	55.94	55.55	22.5	26.94
Tensile Strength (kg/mm <sup>2</sup> )	2.74	2.77	1.4	1.66
Elongation	11.92	15.6	28.2	45.94
Friction index	150	235	-	300

#### 5. Discussion

From the above experimental results, it was observed that an approximate 50 % decrease of modulus occurred in the case that a heat stabilizer was added. Fluorine type resin showed a decrease of modulus.